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Reducing Emissions Through Energy Efficiency Options for EPA Action

John F. Kennedy School of Government, Cambridge, MA

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REDUCING EMISSIONS THROUGH ENERGY EFFICIENCY

OPTIONS FOR EPA ACTION

Julia Batten Brown

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John F. Kennedy School of Government
Harvard University
Cambridge, Massachusetts

Prepared for:

Nancy Kete
United States Environmental Protection Agency
Office of Air & Radiation
Room 925
401 M Street, SW
Washington, D.C., 20460

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Julia Batten Brown

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The EPA faces a fundamental policy dilemma. Electric energy conservation investments have been shown to be an effective means of reducing emissions. But, the EPA does not have the statutory mandate to play an active role in the decision-making processes which ultimately influence ratepayer and utility investments. However, the EPA can successfully promote conservation if it targets education and subsidies to energy conservation and awareness.

The following recommendations utilize EPA's expertise and credibility to promote energy conservation. Special attention is focused on remaining within the parameters of the agency's statutory mission. (1) The EPA should launch a nationwide publicity campaign to promote the idea that investing in energy efficiency is a way to save the environment while saving money. (2) The EPA should fund curriculums researching environmental costs of electricity consumption and the environmental benefits of conservation. (3) The EPA should support legislative attempts to amend the Clean Air Act to require or suggest that least-cost emissions strategy be included in state implementation plans (SIPs).

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EXECUTIVE SUMMARY

The Environmental Protection Agency faces a fundamental policy dilemma. Electric energy conservation investments have been shown to be an effective means of reducing emissions. Further, as a result of the public's concern over the Greenhouse problem and the continuing difficulties in siting new power facilities, there is a groundswell of support to limit electric demand growth as a means to improve environmental quality. Yet the EPA does not have the statutory mandate to play an active role in the decision-making processes which ultimately influence ratepayer and utility investments.

The decision to invest in conservation is influenced by a number of factors none of which fall within the realm of the EPA's legal purview. In light of the EPA's inability to have direct input into these decisions, the question arises how the Agency might have indirect input in the process; this paper will address the question -- What options are available to the EPA to encourage investment in conservation?

The importance of this question to the EPA is founded on the premise that electric energy conservation results in reduced levels of emissions. In this analysis, emissions include carbon dioxide (CO_2) and nitrous oxide (N_2O), as well as sulfur dioxide (SO_2). CO_2, in particular, is included because it constitutes almost 50 percent of the gasses that contribute to the greenhouse effect and the U.S. is the single largest contributor to the atmospheric build-up of carbon emissions -- 33.4 percent of which is generated by electric power plants. Coal-fired plants alone account for 28 percent of U.S. carbon emissions, or approximately 357 million metric tons of carbon a year. Thus conservation could have a significant effect on emissions reduction, particularly in regions that use electricity generated by coal.

The EPA's mission is to protect public health and environmental quality. Reducing pollution in our environment is an extension of that mission. In fulfilling its mission, the Agency must act both reactively and proactively, i.e., to eliminate pollution caused by past

actions and to abate the creation of new pollution. The relationship between electricity consumption and pollution from generating stations, in the present and in the future, is justification for the EPA to pursue conservation as a viable means of achieving both of these goals.

The DOE and state regulatory and energy agencies have already been working to achieve these goal and have expertise and credibility in this field. For the EPA to justify getting involved in an area heretofore within the realm of the DOE, the EPA must demonstrate that its efforts to achieve its mission is best served by direct EPA involvement, and that absent such involvement, those interests would fail to get the attention they merit because DOE funding priorities reflect the agency's mandate and not that of the EPA.

On the other hand, the EPA has a comparative advantage in promoting conservation if it uses the message that conservation reduces pollution. The increasing level of pro-environmental sentiment and the EPA's credibility in this area make this strategy potentially valuable to the EPA.

Several factors influence investment in conservation; these include the price of electricity. education, regulatory requirements, and subsidies. The actors which have some degree of responsibility for, or control over, these factors are numerous and varied, ranging from state utility regulatory and energy offices, to federal legislative bodies and energy regulatory agencies. The degree of influence the EPA can ultimately have on investment in conservation depends the Agency's ability to influence these factors and the parties who exercise power over them.

Of these factors and actors, the best candidates for EPA attention are education and subsidies. Unlike price, which is not easily influenced by an agency whose responsibility lies in protecting the environment, or regulations and standards, which are determined by processes in which the EPA's ability to have influence is limited by its institutional capacity, education and subsidies are factors on which the EPA can have a measure of influence,

particularly by way of funding. That is, EPA-sponsored education and subsidies that support the Agency's effort to abate pollution would be less difficult to justify than attempting to influence processes that aren't accustomed to EPA participation or intervention.

This analysis considers which options provide the EPA with an active role. Thus, while a tax on fossil fuels or appliance efficiency standards would be effective ways to stimulate conservation, these types of options are not included in the analysis since the EPA's capacity to influence or define such policies is limited.

This paper examines five categories of options that the EPA might choose to pursue:

1) a facilitator strategy

2) promotion and education

3) subsidization

4) an interagency strategy

5) an amendment to state implementation plans

The strengths and weaknesses of each option are assessed with respect to five criteria:

a) cost

b) administrative feasibility

c) political feasibility

d) effectiveness

e) statutory authority

These criteria are weighted to reflect the EPA's interests and limitations. As mentioned earlier, the EPA's interest in encouraging conservation is based on the effect that conservation has on emissions. Thus, the greater the impact an option has on reducing emissions, the more valuable that option is to the EPA.

Also important, however, is how an option accommodates the EPA's jurisdictional limitations. That is, options for which it is difficult for the EPA to justify Agency involvement are less attractive than those options for which the Agency can argue (and be

more certain) that EPA participation can bring about environmental benefits that otherwise would not be captured.

Three specific recommendations follow from the above discussion. Each employ the EPA's comparative advantage in the area of environmental protection, capitalizing on the Agency's expertise and credibility and the building momentum to take action to reduce emissions. These recommendations also strive work within the EPA's institutional limits, promoting energy efficiency conservation as a means of fulfilling the Agency's statutory mission.

Recommendation #1

The EPA should launch a nationwide publicity campaign to promote the idea that investing in energy efficiency is a way to save the environment while saving money.

In order for the EPA to effectively encourage conservation it must before all else establish energy-efficiency as an environmental issue in the minds of the American public. If the EPA wanders too far afield in its pursuit of conservation it risks diluting its efforts and losing its credibility as an advocate of increased energy efficiency.

To keep program costs down and minimize administrative difficulty, this program should focus on a media campaign. A media campaign would reach the largest audience, and would capitalize on the nation's growing sensitivity to environmental responsibility. In addition, it's appeal is both environmental and consumer-oriented, capturing the attention of yet a broader spectrum of the populace. Once the public is convinced of the connection between emissions reduction and energy efficiency, further programs to encourage increased energy efficiency should be considered.

Recommendation #2

The EPA should offer grants to existing educational programs both national and regional which offer to expand their curriculum to include a program on the environmental costs of electricity consumption and the environmental benefits of conservation. This

recommendation, like the first one, helps the EPA to achieve its goal while staying within the limits of its institutional capacity. First, it does this by further disseminating the message that energy conservation is a means of protecting the environment, focusing on the message that the inefficient use of electricity harms the environment. Second, by providing grants to existing organizations rather than building a program from the ground up, the EPA puts the responsibility of educating students in the hands of those who have experience and expertise in the field. The Agency can thus use its environmental expertise to provide these organizations with the information necessary to prepare a curriculum to teach students about the environmental impact of energy consumption and conservation.

Recommendation #3

The EPA should support legislative attempts to amend the Clean Air Act to require or suggest that least-cost emissions strategy be included in state implementation plans (SIPs). The Clean Air Act is not often amended. The fact that it is currently under review provides the EPA with a unique opportunity to voice its support for encouraging the use of least-cost emissions strategy as a means of reducing air pollution.

This recommendation also capitalizes on the fact that the EPA already has some measure of input into the process of evaluating proposed legislation. It suggests that the Agency use its institutional capacity to influence the development of legislation which will have a long-term impact on emissions.

INTRODUCTION

The Environmental Protection Agency (EPA) faces a fundamental policy dilemma. Electric energy conservation investments have been shown to be an effective means of reducing emissions. Further, as a result of the public's concern over the greenhouse problem and the continuing difficulties in siting new power facilities, there is a growing groundswell of support for more emphasis on limiting electric demand growth as a means to improve environmental quality. Yet the EPA does not have the statutory mandate to play an active role in the decision-making processes which ultimately influence ratepayer and utility investments in conservation.

The decision to invest in conservation is influenced by a number of factors none of which fall within the realm of the EPA's legal purview. In light of the EPA's inability to have direct input into these decisions, the question arises over how the Agency might instead have indirect input in the process; thus the question this paper will address -- What options are available to the EPA to encourage investment in conservation?

The following analysis examines the conditions under which conservation investment decisions are currently being made and offers several alternatives as to how the EPA can influence these decisions. The second section evaluates these options. The analysis concludes with recommendations for EPA action.

BACKGROUND

The relevance of this question to the EPA, and to the Office of Air and Radiation in particular, is founded on the premise that electric energy conservation (hereinafter referred

to as simply "conservation") results in reduced levels of emissions.* This premise relies on the acceptance of a specific definition of conservation. In many analyses, conservation is lumped together with load management under the title of demand-side management (DSM). Within the context of this report, conservation will refer specifically to programs or measures which are designed to reduce energy consumption at all times (though in varying degrees) as opposed to load management programs or measures which are designed to reshape a utility's load curve, but which result in little or no net decline in overall consumption. Increasing the energy-efficiency of electricity end-uses is the means most often used to conserve.

There are various opinions regarding the magnitude of conservation's impact on emissions levels. A utility's specific fuel mix, seasonal demands, forecasted future demand, customer base, and the type of conservation measure considered are just a few of the variables which influence the amount of emissions reduction that a given conservation measure will realize. However, the emission reductions that result from conservation can be quantified and the costs of such reductions compared to reductions made by other means.

The Wisconsin Public Service Commission in an October 1987 State Acid Rain (STAR) program report proposed two approaches for making this sort of comparison.[1] The first, the avoided control cost (ACC) method, calculates the impact conservation has on emission reduction costs, making it possible to roughly estimate how much, on average, could be spent on conservation programs as part of an emissions reduction strategy.

The ACC method estimates the impact of conservation on electricity demand, converts that figure into a reduction in the amount of necessary electricity generation, and calculates

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* When conservation results in the construction of fewer electric generating stations, there are additional environmental benefits. For example, water and land are conserved for other uses. This paper, however, limits the discussion to the impact of conservation on emissions.

the amount of sulfur dioxide (SO_2) emissions avoided by the reduction in generation. The cost of reducing an equivalent amount of SO_2 emissions via other methods is then translated into an avoided emissions control cost per kWh. Using this method, the Commission staff estimated that the avoided emission control benefit of conservation to Wisconsin was approximately 0.8 cents per kWh conserved.

The second approach analyzes the costs and impacts of specific conservation measures. This method demonstrates how a utility can calculate on a system-wide or plant-specific basis the amount of reduced electric generation necessary to reduce emissions by one ton of SO_2. Using these results and the cost estimates, it is then possible to calculate the cost per ton of SO_2 removed for each conservation measure. These costs can in turn be compared to the costs of alternative means of emissions reduction.

A second study focusing on how conservation could be used as a means of reducing the costs of meeting federal acid rain control legislation was conducted by the American Council for an Energy Efficient Economy (ACEEE) and reported in the Council's 1987 publication, Acid Rain and Electricity Conservation.[2] The study found that an accelerated conservation program alone could save approximately $9.9 billion and, if conservation were incorporated into an acid rain compliance plan, could save $11.3 billion over a compliance plan without conservation.[3]

The subject of the study was the East Central Area Reliability (ECAR) power pool* whose utilities, together, are estimated to emit approximately 33 percent of utility-generated SO_2. The study assessed electricity conservation potential in the ECAR regional of approximately 65 types of conservation measures. Those results were then used as an input into a utility simulation model which examined various parameters for different load growth and emissions control scenarios. One scenario considered only the savings from an

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* The ECAR power pool includes Ohio, Michigan, Indiana, Kentucky, West Virginia, and parts of Maryland and Pennsylvania.

accelerated program of cost-effective conservation, not including the avoided emissions control cost savings. The accelerated case involved a program of rapid adoption of cost-effective efficiency measures over the proceeding 15 years in response to incentives such as rebates. A second scenario added to the savings from accelerated conservation the expected savings in reduced costs of compliance with acid rain legislation requiring a 55 percent reduction in SO_2 emissions by the year 2000.

It must be noted that the study did not include program design, development and administration costs, and assumed 100 percent penetration. Regardless, it serves as a worthwhile analysis of the how an accelerated conservation program can be a cost-effective means of complying with required emissions reduction. If one assumes only 40 percent penetration and administration costs equal to 10 percent of the total cost, conservation measures still could save in the range of $3-4.5 billion.

The following analysis broadens the scope of emissions to encompass carbon dioxide (CO_2) and nitrous oxide (N_2O), as well as sulfur dioxide (SO_2). By including these other emissions the recommendations that arise from this analysis can be applied to a broader geographical region, thus enlarging the discussion to include the issue of global warming. Recent public and congressional concern over the need to address the issue of global warming has been rising and initiatives that offer ways to reduce more than just SO_2 are being received with growing interest.

Including greenhouse gasses in this analysis is particularly important in light of the fact that almost 50 percent of the gasses that contribute to the greenhouse effect are CO_2,* and that the U.S. is the single largest contributor to the atmospheric build-up of carbon emissions -- 33.4 percent of which is generated by electric power plants.[4] Coal-fired plants alone account for 28 percent of U.S. carbon emissions, or approximately 357 million metric

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* Other contributors to global warming include methane (18%), chlorofluorocarbons (14%), nitrous oxide (6%) and other gasses (13%).

tons of carbon a year. Thus conservation could have a significant effect on emissions reduction, particularly in regions that use electricity generated by coal. For example, lighting accounts for about 20-25 percent of the nation's electricity consumption -- the equivalent of nearly one-half of all electricity produced from coal. If lighting efficiency were increased by ten percent, carbon emissions could be reduced by as much as 16 million metric tons a year.

While the relevance to the EPA of identifying ways to encourage conservation is based on the premise that there is an inverse relationship between conservation and emissions levels, the importance of the question is based on yet a second premise -- under the existing statutory arrangement the EPA has limited means to directly affect the level of investment in conservation and thus must search for less direct methods to achieve reductions in emissions through conservation.

In the strictest sense, it would appear that the only direct tool at the EPA's disposal is the emissions rates contained in the state implementation plans (SIPs). The EPA has the statutory authority to ratchet down acceptable emission rates on a pound-per-mmBtu or tons-per-year basis, thus raising the cost of compliance and making investment in conservation an attractive alternative to more expensive emissions-reducing technology.

Faced with a severe reduction in emission rates and much higher compliance costs, utilities might react in a number of ways. They could switch fuels, invest in pollutant-reducing technologies such as flue gas desulfurization, or invest in conservation. Utilities would choose to invest in those strategies or alternatives that would meet these new standards at the lowest cost. In most cases, some level of investment in conservation would be more cost-effective than the other options.

Taking this sort of unilateral action could be politically difficult for the EPA. The political acceptability of major reductions in permissible emission rates is uncertain and would greatly depend on the attitude of the American public. If environmental awareness

continues to grow as it has in response to recent events -- the record-breaking drought of 1988 and the Exxon Valdez accident this spring in Prince William Sound, Alaska -- such changes in emission rates might be acceptable. The uncertainty of the political response, however, should make the search for indirect, more palatable, alternatives all the more appealing to the EPA.

A LONG-TERM PERSPECTIVE – EPA's RESPONSIBILITIES

The EPA's mission is to reduce pollution in our environment. In fulfilling this mission, the Agency must act both reactively and proactively, i.e., to eliminate pollution caused by past actions and to abate the creation of new pollution. These actions have both short- and long-term impacts. Actions aimed at short-term results are most often directed at existing pollutants resulting from past investments. Equally important, however, is the need to direct attention towards actions aimed at longer-term abatement efforts -- programs which will reduce the need for future corrective action. The new Administrator has indicated that he intends to redirect attention towards a longer-term perspective, and to address what steps can be taken today that will lead to reduce the costs of pollution cleanup and abatement tomorrow.[5]

A period of economic development is a time when investment decisions are being made which will have a long-term impact on the environment. For example, a contractor building an office building is effectively creating future demand for electricity, the generation of which will result in the emission of pollutants into the atmosphere. This is because there is a relationship between electricity consumption and pollution from generating stations, in the present and in the future. Programs to reduce the former will also reduce the latter, albeit the extent and rate of reduction is difficult to predict.

If the contractor's office building were built incorporating existing and proven high-efficiency technologies, it would reduce the utility's future resource requirements and the

resulting level of emissions. Were the office building built to less strict standards, it would be responsible for a higher level of pollution. Granted, it would be possible to retrofit the building in the future to capture some of the available conservation opportunities. In fact, the ACEEE study[6] discussed earlier included an analysis of a hypothetical office building chosen to match the stock average of electricity consumption values. It estimated that the installation of seven conservation retrofit measures can reduce electricity consumption by 48.5 percent compared to the base level. It must be noted, however, that since conservation retrofits are more expensive than as-built measures, at low energy prices many conservation opportunities are not cost-effective and thus the potential emissions savings are lost. This is an example of where it can be less expensive to prevent future pollution now through investment in energy efficiency than to reduce it in the future.

A COMPARATIVE DISADVANTAGE OR ADVANTAGE?

In light of the contribution electricity generation makes to global warming and acid rain, it is tempting to suggest that the EPA take the lead role in the effort to stimulate conservation. The problem with this strategy is that the DOE and state regulatory and energy agencies have already been working to achieve this goal with a vast array of programs, many of which have been de-funded in the past eight years. These agencies thus have a comparative advantage over the EPA in that they have the expertise and credibility to run conservation programs. Why should the EPA, an agency that itself is under-funded and already under enormous pressures to stretch its resources to meet growing demands, try to duplicate these efforts?

If the EPA seeks to actively encourage conservation it will likely run up against the opposition of the abovementioned agencies. Thus, in order for the EPA to justify getting involved in an area heretofore within the realm of the DOE, the EPA must demonstrate that its interests are best served by direct EPA involvement, and that absent such

involvement, those interests would fail to get the attention they merit because DOE funding priorities reflect the DOE mandate and not that of the EPA. The EPA therefore must concentrate its conservation efforts in those areas where the environmental returns are the highest.

Assuming that the discussion in the preceding sections is proof enough that the EPA has reason to be interested in stimulating conservation, it is important to consider how the Agency can use what resources it might be given for this effort to achieve the greatest environmental benefit. One approach would to be to target EPA efforts at regions and programs with the greatest potential to reduce emissions. For example, programs that can be targeted at regions where coal-fired plants are predominant would have greater impact on emissions reduction than programs in regions where electricity is generated by hydroelectric or nuclear facilities.* Similarly, EPA funding for programs that have been proven to save large quantities of electricity with a high degree of certainty would be better spent than if it were used to sponsor pilot programs for new technologies.

Yet despite the fact that the EPA lacks expertise in the area of promoting conservation, it does possess some comparative advantages over energy agencies. The issue of the environment is quickly rising to the top of the political agenda. The environment was an issue in the 1988 presidential election, and in the weeks following the Exxon Valdez accident in Prince William Sound, Alaska, rivaled most any other topic for space on the front page of major newspapers and lead stories on news broadcasts. The nation is becoming sensitized to the environment and the momentum continues to build.

Moreover, the EPA has credibility in the area of environmental issues that no energy agency enjoys. Thus the emissions-conservation link is a sales pitch for conservation that

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* Conservation in these regions can reduce emissions in cases where excess electricity resulting from conservation can be sold to neighboring regions, allowing them to defer construction of new generating capacity.

the EPA and state environmental agencies can use more effectively than energy agencies. The combination of these two elements means that while the EPA should try to encourage conservation where it will get the highest return for its efforts, it should also consider how it can best use its comparative advantages.

FACTORS THAT INFLUENCE CONSERVATION INVESTMENT

In order to devise a realistic list of options for the EPA, it is important to know what means are available to encourage conservation. The object of this section will be to identify and understand the factors that traditionally influence investment in conservation. Knowing how each factor stimulates a particular response and who exercises power over those factors, it will be possible to identify which tools the EPA has at its disposal to encourage conservation and which parties the EPA must seek to influence.

Conservation has been and/or is currently being implemented throughout the country in response to any of several factors -- price of electricity, education, regulatory requirements, and subsidies. This section will examine these factors and how they influence investment in conservation, as well as the parties the have some degree of responsibility for, or control over, them.

Price

In the latter half of the 1970s, ratepayers responded to the high price of electricity by seeking ways to reduce consumption. Their responses ranged from long-term investments such as the installation of home weatherization by residential users and conversion to high efficiency production processes by industrial users, to short-term investments such as higher efficiency lighting by commercial and residential users.

The price of electricity also influences conservation investment at the utility level. Currently at least eight states require utilities to implement a comprehensive least-cost strategy which includes conservation programs.[7] As a result, as these utilities find themselves in need of more capacity, they are required to consider cost-effective conservation programs as viable options to supply-side sources. In most cases, utilities in these states must first invest in conservation programs which are less expensive than supply options before investing in new generating capacity. Thus, as the cost of generating electricity rises in response to rising fuel costs, compliance with more stringent environmental requirements, etc., conservation becomes more cost-effective than many supply-side options.

Awareness and Education

Ignorance is not always bliss. Today we are suffering from the symptoms of one of the classic economic market failures -- imperfect information. At the current price of electricity, there exist conservation measures which are cost-effective for the ratepayer to install without any subsidization. Such measures include high-efficiency lighting retrofit measures in office buildings which can reduce lighting energy consumption by about 15 percent at a marginal cost of saved energy (CSE)* of $0.054/kWh or a high-efficiency clothes dryer with moisture sensor that can reduce electricity consumption by approximately 15 percent at marginal CSE of $0.047/kWh.[8] However, most ratepayers are unaware of available technologies and potential savings and as a result are under-investing in conservation. Furthermore these

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* The marginal CSE is calculated by multiplying the cost of the energy efficiency measure by the appropriate capital recovery factor and dividing by the incremental annual electricity savings.

technologies are continuing to improve both in performance and price, yet ratepayers remain ignorant of the cost-saving conservation opportunities accessible to them.

Many ratepayers are unable to properly assess the value which investment in conservation measures offers them. When making purchase decisions, the average ratepayer does not take into consideration the costs of using an electrical device (light bulb, dishwasher, etc.) over its lifetime. Purchase decisions are more strongly influenced by the sticker price. That is, ratepayers faced with high up-front costs for energy efficiency investments, ranging from high-efficiency light bulbs that cost twenty times more than a standard bulb to a high-efficiency refrigerator that may cost $300.00 more than a low-efficiency model, will most often opt for the less expensive, less efficient model.* For this reason, some utilities across the nation have begun special programs to increase consumer awareness about the availability of high-efficiency options and the savings they offer. These programs range from free energy audits and light bulb exchanges, to energy management networks and design assistance.

One highly successful example is the Bonneville Power Administration's (Bonneville's) Blue Clue Program which "awards" the top 15 percent most efficient refrigerators and freezers with a blue ribbon, known as the "blue clue." This designation alerts the consumer to the differences in appliance efficiency. Given the fact that household appliances are the second greatest residential end-use of electricity after heating, ventilation and air

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* This is because some ratepayers place a much higher value on the money they have today than on that which they will have tomorrow. These ratepayers, be they residential, commercial, or industrial, have higher discount rates than society as a whole. As a result they are suffering from yet a second market failure - imperfect capital markets. The subsequent under-investment in conservation is one of the arguments put forward by those who advocate subsidies in the form of rebates and no- or low-interest loans.

conditioning (HVAC) systems, a program that spotlights high-efficiency models can make a significant contribution to reducing a utility's long-run demand.

Regulation and Legislation

Many state public utility commissions or their equivalent (hereinafter referred to generically as "PUCs"), either under pre-existing statutes or newly enacted legislation, require utilities to invest in conservation. The mechanisms for requiring conservation vary from state to state. As mentioned earlier, at least eight states currently mandate investment in conservation under the auspices of a least-cost or integrated resource planning requirement. Some states even require utilities to spend a set percentage of revenues on conservation programs. New York and California, for example, require their utilities to spend 0.025 and 0.05 percent of revenues, respectively, on conservation programs.

Increased regulatory attention is being paid to conservation and least-cost planning. The National Association of Regulatory Utility Commissioners (NARUC) is working to promote the adoption of least-cost utility planning by its members. Its efforts include the preparation and publication of a least-cost planning handbook intended to educate commissioners and senior staff on the various approaches to instituting the least-cost process at the state regulatory commission level.[9] NARUC has also encouraged work investigating ways to restructure utility regulation so that it rewards utilities financially for investing in conservation and other non-supply-side resource options.*

The Federal Government has also taken steps to promote conservation by passing legislation that raises the level of energy efficiency in the U.S. In 198~. Congress passed the

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* See the paper contained in the proceedings of the NARUC's Least-Cost Planning Conference held in Aspen, Colorado, April 10-13, 1988, delivered by Commissioner David Moskovitz titled, "Will Least-Cost Planning Work Without Significant Regulatory Reform?".

National Appliance Energy Conservation Act which set minimum efficiency standards for certain large appliances.* An analysis of the savings resulting from these new standards shows that peak electricity demand would be reduced by 22,000 MW in the year 2000.[10] Prior to the Act, only one other governmental entity had taken action to mandate higher efficiency standards. In 1984, the California State Energy Commission set statewide appliance efficiency standards for refrigerators and freezers which exceeded even existing national standards.

Subsidization

Energy conservation investment subsidies are available at the local, state, and federal levels. Existing Federal subsidies include the U.S. Department of Energy's (DOE) Weather Assistance Program, Institutional Conservation Program, and Low Income Home Assistance Energy Program. Numerous state and local subsidy programs are available throughout the U.S.[11] These programs are sponsored and/or organized by a wide range of government and private groups ranging from state offices of economic opportunity and community action agencies, to joint state- and utility-sponsored non-profit energy service corporations, local universities and environmental groups.

The Actors

In order to address the question of how the EPA can promote investment in conservation, it is important to know not only the factors that have influence in the investment decision, but the relevant actors that have direct control over these factors. The table below summarizes the factors discussed above and the actors who control them.

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* Appliances covered by the Act include refrigerators, freezers, water heaters, dishwashers, ranges, and clothes washers and dryers.

Factors	Actors
Price	PUCs State energy offices (SEOs) Federal Energy Regulatory Commission (FERC) via notices of proposed rules (NOPRs) Congress via legislation like the Public Utility Regulatory Policy Act (PURPA) or energy taxes
Education/Awareness	PUCs SEOs DOE Utilities (unilaterally or in response to requirements made by the above agencies) Private contractors Non-profit organizations Public Staff or Peoples' Councils
Legislation/Standards	SEOs Governor and State Legislature DOE Congress
Regulation/Planning	PUCs SEOs State planning agencies (if different from above) Utilities (in response to requirements made by the above agencies)
Subsidies	SEOs Governor and State Legislature DOE Congress Non-profit organizations

While each of the above factors and the parties that have some measure of direct control over them are a potential vehicle for the EPA to stimulate investment in

conservation, some are better candidates for EPA attention than others. Price, for example, would not be easily changed by an agency whose responsibility lies in protecting the environment. The EPA's ability to prompt new regulation or the institution of higher energy efficiency standards would also be limited by its statutory mandate. Education and subsidies, however, do not share these obstacles.

Unlike price, regulation, or standards, education and subsidies are factors which depend less on the level of influence the EPA has in the process and more on the availability of funding. While the EPA is far from cash-rich, it may find it less difficult to justify funding energy conservation programs that support its effort to abate pollution than attempting to influence processes that aren't accustomed to EPA participation or intervention. These considerations are important and should be given attention when weighing the following options.

OPTIONS

As the preceding section illustrated, the level of investment in energy conservation can be influenced in a number of ways. There is, however, a trade-off between the degree of authority the EPA has to pursue an option and the magnitude of the impact that option has. That is, the options for reducing consumption in which the EPA has the least authority, the impact on conservation may be the greatest; the greater the role the Agency has in a program to stimulate conservation, the smaller the impact on conservation.

An tax on fossil fuels, for example, would be the most effective means of stimulating investment in conservation, yet the EPA has little influence within this domain. Even an "environmental" tax would fall under the jurisdiction of the Senate Finance and House Ways

and Means Committees -- committees that aren't traditionally concerned with environmental legislation. A similar case can be made for appliance efficiency standards. Thus, in keeping with the intent of this paper, this analysis will consider the options that fall into the latter category, i.e., options which provide the EPA an active role in efforts to increase investment in conservation.

The discussion of the following options includes an examination of their strengths and weaknesses with regard to the following criteria: cost, administrative and political feasibility, effectiveness and statutory authority. The evaluations are not exact, e.g., they do not focus on the precise costs of subsidy programs, but will, instead, consider these criteria in terms of their magnitude. At the end of the section is a matrix summarizing the options. Recommendations follow.

A Facilitator Strategy

The geographic dispersement of the regional offices affords the EPA the opportunity to organize regionally-oriented efforts to encourage conservation and reduce emissions. A facilitator role for the EPA would be a relatively inexpensive way to heighten awareness of conservation's environmental benefits among those state actors in a position to stimulate conservation within their jurisdictions. In addition, administration would be manageable if implementation were handled on the regional level by state environmental agencies with EPA regional staff participation.

There are several ways the EPA could act as a facilitator. The Agency could sponsor the creation of regional conservation clearinghouses to help disseminate information on conservation programs that have significant environmental benefits; it could encourage existing regional energy organizations to include the consideration of environmental benefits

in the promotion of conservation; or it could provide forums for the discussion and exchange among parties in a position to directly influence conservation investment and those interested in preserving the environment. Each of these methods are discussed in turn.

The first method, a clearinghouse for information on conservation and energy efficiency programs, would create a place to which state PUCs, SEOs and utilities could turn to find out what lessons other commissions and utilities in the region have learned in their efforts to implement conservation programs and improve energy-efficiency. An EPA-sponsored clearinghouse would promote shared information between states and ideally reduce the amount of redundant testing that may be occurring. This effort could perhaps be coordinated with DOE's Energy Extension Service (EES) which gives planning grants to state energy offices for the purpose of providing outreach services to small energy users.

The second method would build on existing interregional bureaucratic structures. For example, currently eleven formal regional utility power pools exist accounting for over 40 percent of the total national electric capacity and roughly one-half of all jointly owned generating plants involve utilities with multi-state operations. These regional organizations could be used as the medium for combining the resources of several states and for sharing information on conservation and its environmental benefits among member states facing similar conditions -- economic, climatic, etc. The EPA could assist in the formation of a task force within each power pool to consider conservation as a means of reducing the uncertainties as pertains to reliability in the future.*

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* See Eric Hirst, Effects of Energy-Efficiency Programs on Load-Growth Uncertainty for Electric Utilities, Oak Ridge National Laboratory, ORNL/CON-260, United States Department of Energy, Oak Ridge, Tennessee, August 1988.

A third way for the EPA to act as a facilitator could be for regional offices, in tandem with state air offices, to host or sponsor workshops or conferences targeting the decision-makers who can influence the level of investment conservation within the region -- representatives of SEOs, PUCs and utilities -- and tailoring the discussion to region-specific conditions.

Over the past several years the EPA's State Acid Rain (STAR) program has sponsored the initial stage of this sort of process. Workshops in Region V and Region I, in particular, have brought representatives of three state agencies -- air quality, energy and regulatory -- together to enhance mutual understanding and cooperation in the context of coordinating efforts to comply with pending acid rain legislation. These workshops have proven to be quite productive and could be used as a forum for the EPA to solicit further help in achieving specific goals like reducing emissions.

The STAR-sponsored workshops were successful at what they set out to accomplish, yet they were held mostly in regions where many utilities are already actively implementing conservation and demand-side management or where state legislatures are already seriously considering least-cost legislation. The Agency could build on this idea and begin the process of moving forward to the next step. Based on the gains shown to be possible in these more receptive regions, the EPA could now focus its efforts on hosting workshops in regions that have not yet begun to consider the concept of integrated resource planning and/or utility-sponsored conservation and where there remain significant conservation savings to be captured.

The cost of administering these types of options would vary depending on their scope. The cost of a workshop, for example, depends on several variables, e.g., the number in

attendance, the distance they must travel, the length of the workshop, whether a contractor is hired to coordinate the workshop, etc. Workshops funded by the STAR program cost in the area of $5,000 to $50,000 a piece. A nationwide program of workshops might run in the neighborhood of $1-2 million.

A clearinghouse would inevitably be more expensive -- designing the program and entering the backlog of existing data would be an enormous task. For comparison, the DOE's Energy Extension Service was initially budgeted $28 million in fiscal year 1980.* Once established, however, the cost of maintaining the clearinghouse would depend on the level of services offered. Services could range from a simple hot-line referral service which would require one or two staff people at each regional office to an information service providing documentation on conservation and energy efficiency that would require a staff perhaps an order of magnitude greater.

Administration for these proposals would most likely be at the regional level. It could be structured by headquarters but should leave the decision of how the services are delivered to the discretion of the regional offices so that they may take advantage of local resources, e.g., non-profits or state energy offices.

The effectiveness of this strategy would vary from region to region. Those states that have done the least so far in the area of conservation would likely benefit most and vice versa. Regional clearinghouses would have moderate potential to encourage investment judging from the response to experienced by EES before funding was cut back. The impact of workshops would likely be realized in the medium and long term rather than in the short

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* This figure was reduced drastically by the Reagan Administration and today is only $3.9 million.

term. This is because of the lag time between workshops and discussions, the promulgation of regulations and, finally, the investment response to those regulations.

From the political perspective, the clearinghouse proposal raises the issue of comparative advantage and institutional capacity mentioned earlier. Neither the EPA nor the state air offices have the necessary expertise in energy conservation to put together a conservation clearinghouse. DOE and many state energy offices have experience in this area, but lack the funds to provide services beyond those provided by EES. In order to justify assuming responsibility for a clearinghouse, the EPA would have to argue that the environmental benefits of a clearinghouse overwhelmingly warrant EPA involvement. It might be difficult for the Agency to make this argument given the availability of other options that are better-suited to EPA interests.

In the case of the workshops, the EPA would have to be careful walking the fine line between facilitating and meddling. The Agency does not have the authority to require state agencies or regional organizations to participate in workshops. Participation must be voluntary, therefore the EPA would have to market the idea to these groups, highlighting the potential benefits to participation and covering the costs to participants.

The goal for EPA in pursing a facilitator strategy would be to nurture the consideration of its interest -- protecting the environment -- where it has not traditionally been a topic of concern. These proposals are a means of reaching out to states and regions that up until now have experimented the least with conservation and thus lack the experience and expertise to confidently and efficiently do so now.

EPA as Promoter and Educator

In order to effectively use the environmental argument to stimulate investment in energy conservation, the EPA would need to establish a link in the public's minds between energy conservation and environmental responsibility. This would require a large-scale effort on the part of the Agency to get the word out.

Establishing and reinforcing a link could be accomplished in a number of ways. The Agency could launch a nationwide campaign with substantial endorsement from a wide range of national and local figures. Various media, e.g., television, radio and print media, could carry the message and an education program in the schools could concurrently focus the campaign on students. Reinforcement of the link could then be made through a promotional campaign for high-efficiency appliances that are "environmentally responsible."

The advantage of this option is that it would go around the regulatory "middlemen" and go straight to the individual consumer of electricity. This is the most direct means the EPA has to present the environmental argument for conservation to the most fundamental level in the decision chain -- the end-user. Whether or not state regulators require least-cost planning or utilities offer rebates for lighting retrofits, the ultimate decision to conserve will be made by the consumer.

The campaign could begin with a television and radio advertisement drawing attention to the relationship between energy consumption and emissions. Envision a public service message with a sales pitch along the following line:

> [setting: The EPA Administrator, caption below identifies him and his previous affiliation with environmental groups, strolls along an attractive natural setting, comes upon an electric generating facility, pauses and speaks.]
>
> I care about the environment, but I'm not here to ask you to donate your hard-earned money to save the environment. I'm here to tell you that by taking steps to save money, you help reduce the level of air pollution generated every day by plants like this one here behind me.

How, you might ask. By replacing just one 100-Watt light bulb in your home or office with a high-efficiency bulb, you can reduce your energy bill by as much as $\$$____ a year. The money you save will more than pay for the more efficient bulb, which incidentally will last 20 times longer than a normal bulb. But more important to me, the kilowatts that you no longer use will no longer have to be generated by burning coal, gas, or other hydrocarbons. That means your investment in a high-efficiency light bulb will save you money and save the environment at the same time.

Think about it. With high-efficiency light bulbs you can continue to light your home or office at a lower cost and have the added satisfaction of knowing that you're helping the U.S. EPA to preserve our atmosphere as well as to reduce water pollution and solid waste production.

[voice-over: Interested in learning more about ways you can save money by conserving? Call this number for more information about conservation opportunities in your area.]

The EPA could concurrently sponsor education programs to reinforce the importance of conservation and environmental responsibility. Since students are the future consumers of electric consuming appliances, an EPA investment in a program to increase their awareness today might reduce not only current consumption but future consumption as well.

An existing program that the EPA could sponsor is the National Energy Education Development project (NEED). NEED focuses on educating students about energy efficiency but has recently begun to address other issues including global warming and solid and hazardous wastes. The program encourages students, K through 12, to become actively engaged in the discussion of these topics through the use of role-playing. This national organization produces educational fact sheets and activity materials and trains state and regional leaders -- both students and teachers. Implementation takes place at the state and regional level with the cooperation and support of state energy and education offices.

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* This figure would represent the national average price of electricity at the time the advertisement was produced and an estimate of annual hours of use.

Once such a link is more firmly established in the minds of the public, the EPA could capitalize on it to use promotional techniques that would educate the public about ways it could save money and the environment. For example, just as some utilities have used blue ribbons to designate appliances that meet efficiency standards deemed adequate by the utilities, so could the EPA award its own endorsement to conservation investments judged to be major contributors to its efforts to improve the environment, e.g., major household appliances exceeding an EPA "environmental standard."

Neither promotion nor education are traditional functions of the EPA. Thus proposals aimed at either goal would require the EPA to seek outside assistance. The national office of the NEED project, for example, manages on an annual budget of approximately $500,000. However, additional expenditures are made at the state level, by the states, bringing total annual program costs over $1 million. Professional marketing support would be necessary to launch the type of promotional campaign mentioned above. The total cost of these services would depend on the scope of the effort. A television commercial, for example, could run in the neighborhood of $1,000 per second to produce. Bonneville's Blue Clue Program covering the territory of the Pacific Northwest* had an initial budget of $800,000, $500,000 or which was devoted to the advertising campaign. If you extrapolate this for the rest of the country, the cost would be in the range of $8-10 million.

It could also be potentially expensive getting access to the various forms of media. A large-scale promotional campaign sponsored by the EPA would be newsworthy and would likely receive the attention of the press. However, the Agency would unlikely be able to

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* Bonneville serves Washington, Oregon, Idaho, and parts of Montana, Wyoming, and Nevada.

afford the cost of air time and print space for a nationwide campaign. Therefore, the costs of the promotional campaign would depend on the Agency's ability to make use of free public service time and space. The drawback of this would be that public service messages are aired at the discretion of each television and radio station and are rarely shown during prime time when audiences are the largest.

Costs could be minimized and administration streamlined if the program were coordinated through headquarters. Promotional materials could be first designed to address a national audience and regional offices could submit region-specific details for incorporation into more targeted materials. The more the materials are targeted,however, the higher the overall program costs.

It is worth noting that the services and skills acquired by the EPA for this program would have other possible applications thus allowing the Agency to spread the program costs over a broader base. For example, while the promotional and educational proposals discussed herein are limited to electric energy conservation, these types of programs could also be used to promote other EPA programs.

The political feasibility of these proposals would be relatively high. The issue is the environment -- inarguably the business of the EPA -- and there is even precedent for EPA promotional efforts of this type. Several years ago the EPA sponsored a public service message on the Wetlands Project featuring James Michener. On the other hand, the administrative feasibility of these programs would be less. Administration for promotion would be best left to headquarters in order to minimize costs. Education would be implemented on the state and local level and would require a structure such as that of the NEED project.

The effectiveness of promotional and educational programs is difficult to measure with any accuracy. Determining whether an investment in conservation was made in response to these programs or would have occurred anyway would require a control group that was not exposed to the programs. This would not only be difficult, but perhaps impossible to do with any degree of certainty. Given the relatively low cost of educational and promotional programs, the impact need not be overwhelming to justify the program expense. Bonneville, for example, estimated that if ten percent of purchases were more efficient as a result of the Blue Clue Program, the program would pay for itself.[12]

Subsidization

Subsidies are another way for the EPA to go more directly to the consumer, though in a less direct way than the above option. Various subsidies such as grants -- matching, planning, etc. -- could be used to provide states with funding for programs aimed at encouraging their citizens to invest in conservation.

Yet the EPA would not want to subsidize just any conservation. Given the number of DOE grant programs that exist, but lack funds, it would not be in the EPA's interest to spend its scarce resources on similar programs unless the environmental benefits warranted EPA funding. Therefore, the types of subsidies the EPA should provide are those that would encourage conservation programs with the greatest impact, e.g., commercial lighting and high-efficiency industrial processes in areas in which utilities have the greatest emissions.

EPA subsidies could take many forms. The EPA could offer grants to states that would fund pilot programs where few conservation services have been offered and the potential savings, and thus emissions reductions, are high. Subsidies of this type would

finance the learning curve of both PUC and utility people on the design and implementation of an effective conservation program, allowing them the opportunity to develop the necessary expertise to evaluate and offer (or require, as in the case of PUC staff) full-scale programs. The EPA could also offer matching grants for the implementation of conservation programs deemed to meet a set of cost-effectiveness and reductions criteria. The intent of such grants would be to make a marginally cost-effective program more attractive for a utility to implement given the grant's subsidy.

A third method would be to create planning grants which would be available to states wishing to investigate the existing conservation opportunities and/or the potential benefits to initiating least-cost planning within their jurisdiction. Possible plans could range from proposals to conduct generic PUC hearings on least-cost planning to the preparation of a state-wide energy conservation report. In order to maximize the benefits of this type of grant, however, funding should be awarded on the basis of how far the proposed plan will help the state move towards an understanding of the environmental benefits of conservation. In that way, the grant resources would not be drawn off by those states which have already made significant progress in encouraging conservation.

The cost of these subsidies would depend on the size and number of grants the Agency would choose to make. For comparison, the STAR program received a $3 million appropriation over two years to help states develop technical and institutional capabilities to implement acid rain controls.

Administering these grants would be relatively straightforward; the EPA is no stranger to this activity. More difficult would be the task of designing the grant programs and evaluating planning grant proposals involving energy. In order to ensure that the grants

were going to programs that would have the greatest effect on consumption, and thus emissions, EPA staff would have to consider factors ranging from a utility's fuel mix to the conservation program's savings potential. Given DOE experience in this area, the EPA might consult with them to design program criteria and follow-up. If necessary, contractors could be retained to evaluate the energy component of grant applications.

The political feasibility of this proposal is moderate. As mentioned earlier, while the EPA would be seeking to fund activities that have pollution abatement effects, these types of grants have been traditionally the responsibility of DOE. Thus the Agency might face the least resistance if it were to pursue those conservation programs with the greatest effect on emissions. In addition, the more the Agency could target these grants to programs and regions where they would bring about the greatest reductions in consumption, the greater the overall effectiveness of the grants.

An Interagency Strategy

One of the major difficulties the EPA faces in attempting to encourage conservation is that conservation has always been one of the responsibilities of the DOE. Unfortunately, as the DOE has suffered major budgetary cutbacks in the last eight years so has its conservation programs, thus the Department has made far less progress in promoting conservation than it could have had it been given more resources.

In light of the EPA's environmental interest in conservation, EPA participation at the executive level in decisions affecting conservation might be warranted. A vehicle for such EPA participation is the interagency council. Interagency councils provide a structure within which agencies sharing common interests can work together towards a common goal.

The Blueprint for the Environment recommends that the President "direct the Secretary of Energy to take immediate steps to develop a National Least-Cost Energy Plan that allows all energy investments to compete on a fair economic basis, while taking into account the environmental costs associated with fossil fuel use."[13] [emphasis in the original]. Given the importance the EPA has placed on identifying and confronting the causes of global climate change and the degree to which electric generating plants contribute to the problem, the Agency could make a strong argument that it should be included in the development of DOE policy which pertains to the environment.

An interagency council of representatives from the DOE and EPA might be an effective way to respond to the Blueprint's recommendation. The environmental expertise of the EPA participants could be used to ensure that the final national plan is drafted to accurately include consideration of the environmental benefits and costs of the various supply and demand options.

The costs of EPA participation in these interagency bodies would consist of the salaries of EPA staff assigned to work with DOE plus any overhead. Thus the cost of these proposals could run from as little as $400,000 a year for three participants and support up to any greater amount Congress would be willing to allocate. The larger the staff, the more the EPA could contribute to the deliberative process.

The main obstacle to this proposal is the need for authorization. In order to get the necessary executive or congressional authorization for the establishment of an interagency council, the EPA would have to argue that its statutory mission to abate pollution in effect gives it the responsibility to promote conservation in certain circumstances, and that such an interagency council or similar body would be an appropriate means to achieve that end.

The Agency could also point to precedent; the Water Resources Council is an example of an interagency planning and coordinating body created by legislation to bring together agencies with shared interests.[14]

An additional consideration is whether the Congress or the President will instruct the DOE to review and revise national energy policy any time in the near future. The uncertainty of this happening anytime soon, reduces the benefits of EPA participation in an interagency council, thus reducing the potential effectiveness of this option.

The political and administrative feasibility of an interagency council would depend on how well this proposal would be received by DOE, which, in turn, would depend on how the council were authorized. DOE would undoubtedly have the lead position in a council on energy, making administration simple for the EPA. Less certain would be DOE's willingness to work with EPA. The effectiveness of EPA participation in this kind of interagency council would be indirect and, like the political feasibility, would depend on DOE and the role it would allow the EPA to play.

<u>An Amendment to State Implementation Plans (SIPs)</u>

An obvious vehicle for promoting conservation are the pending amendments to the next Clean Air Act. A number of possible requirements could be included in the Act ranging from a suggestion that state implementation plans (SIPs) include a least-cost emission reduction strategy similar to that in the bill introduced at the end of the 100th Congress by Representative Don Bonker (D-WA), to a requirement that SIPs use least-cost emission reduction strategies to comply with the Act.

The states would ultimately bear the burden of such an amendment and might raise strenuous objections to the inclusion of such requirements or suggestions. Environmentalists

would likely offer their political support for the amendment, but might not succeed in countering the states' objections.

The direct cost to the EPA of these suggestions or requirements would be additional staff costs incurred in setting specific criteria for the states to meet, consulting with states during the preparation of their SIPs, and evaluating this new component of the SIP. The EPA's experience in administering SIP amendments would make overall administration relatively easy, however, existing EPA staff may not have the necessary expertise to deal with the increased responsibilities mentioned above. Accordingly, additional EPA staff costs would mean that this type of SIP amendment would cost on the order of $1-2 million for a specialized staff plus support (or a contractor).

The political feasibility of this provision will ultimately determine its strength. As in the case of taxes and appliance efficiency standards, the EPA does not have a direct role in the drafting of the Act, however, in this case, the EPA does have some input in the process. As it comments on the bill introducing various amendments to the Act, the EPA can highlight the absence or presence of provisions addressing least-cost emission reduction strategy.

Summary of Options

The above options and their relative strengths and weaknesses are presented in the following matrix. Each option is rated based on five criteria: cost, administrative feasibility, political feasibility, effectiveness, and statutory authority.

One of the most notable features of this matrix is that no one option stands out above the rest. However, the matrix shows where each option is weak and makes it is possible to pick out these options which measure up worse than the others. The interagency strategy

is potentially the least expensive option, yet despite this advantage, it compares poorly with the other options in terms of the other criteria. Similarly, the clearinghouse stands out for not ranking well in any of the criteria; it is not only the least politically feasible option, but could also be the most expensive one.

Having pointed out the two weakest options, the matrix goes no further to help the reader draw any definitive conclusions about which option or options the EPA should pursue. Thus we must step back and reevaluate the EPA's reasons for wanting to pursue any of these options, and the comparative advantages the EPA has over others to encourage conservation using these options.

OPTION	COST	ADMINISTRATIVE FEASIBILITY	POLITICAL FEASIBILITY	EFFECTIVENESS	STATUTORY AUTHORITY
CLEARINGHOUSE	$4-28 MILLION	MODERATE	LOW	MODEST POTENTIAL	YES*
WORKSHOPS	$1-2 MILLION	MODERATE TO HIGH	MODERATE TO HIGH	INDIRECT, NOT IMMEDIATE	YES*
PROMOTION	$8-10 MILLION	MODERATE	MODERATE TO HIGH	UNCERTAIN, GOOD POTENTIAL	YES*
STUDENT EDUCATION	$1-2 MILLION	MODERATE	MODERATE TO HIGH	UNCERTAIN, GOOD POTENTIAL	YES*
SUBSIDIES	VARIABLE ~$5 MILLION	MODERATE	MODERATE	UNCERTAIN, GOOD POTENTIAL	YES*
INTERAGENCY STRATEGY	$0.4-1 MILLION	MODERATE	UNCERTAIN, MODERATE	INDIRECT, UNCERTAIN, NOT IMMEDIATE	NO
SIP AMENDMENT	$1-2 MILLION	MODERATE	UNCERTAIN, POTENTIALLY HIGH	GOOD POTENTIAL	COMMENT ONLY

* Under Section 105 of the Clean Air Act, Congress has the authority to appropriate funds for state aid. EPA projects such as those mentioned in the options would require congressional appropriation.

RECOMMENDATIONS

The EPA must adopt a strategy that will most effectively help the Agency achieve its goals within its means. The EPA's goal in trying to encourage conservation is derived from its interest in reducing present and future emissions that have been shown to have detrimental effects on the atmosphere. The means that the Agency has to achieve this goal are limited by the fact that the EPA is in the business of protecting the environment and is not an expert in energy efficiency; the DOE and most state energy offices have the experience and expertise that gives them credibility in this area.

Given that the options described are not mutually exclusive, it is tempting to recommend that the EPA pursue elements of several options, many of which lend themselves to scaled down implementation either in the form of pilot programs or programs offered only in those regions where the emissions, and thus potential for reduction, are the highest. However, the EPA has limited resources and must therefore focus its effort where it can be most effective. This does not mean that the remaining options should be ruled out, but that some actions have clear advantages over others.

The EPA must capitalize on it strengths and the opportunity of the moment. While the EPA may not be an expert in energy efficiency, it does have a comparative advantage in its own field, the protection of the environment, and therefore should pursue alternatives that make use of that advantage. In addition, recent events, such as the drought of 1988, have sensitized the American public to the fragile nature of the environmental and made them more receptive to solutions proffered to address the causes of atmospheric degradation. This growing awareness gives the EPA a receptive audience for a new initiative aimed at reducing emissions through investment in energy efficiency.

Three specific recommendations follow from the preceding discussion. Each employ the EPA's comparative advantage in the area of environmental protection, capitalizing on the Agency's expertise and credibility and the building momentum to take action to reduce

emissions. These recommendations also strive work within the EPA's institutional limits, promoting energy efficiency conservation as a means of fulfilling the Agency's statutory mission.

Recommendation #1

The EPA should launch a nationwide publicity campaign to promote the idea that investing in energy efficiency is a way to save the environment while saving money.

In order for the EPA to effectively encourage conservation it must before all else establish energy-efficiency as an environmental issue in the minds of the American public. If the EPA wanders too far afield in its pursuit of conservation it risks diluting its efforts and losing its credibility as an advocate of increased energy efficiency.

To keep program costs down and minimize administrative difficulty, this program should focus on a media campaign. A media campaign would reach the largest audience, and would capitalize on the nation's growing sensitivity to environmental responsibility. In addition, it's appeal is both environmental and consumer-oriented, capturing the attention of yet a broader spectrum of the populace. Once the public is convinced of the connection between emissions reduction and energy efficiency, further programs to encourage increased energy efficiency should be considered.

Recommendation #2

The EPA should offer grants to existing educational programs both national and regional which offer to expand their curriculum to include a program on the environmental costs of electricity consumption and the environmental benefits of conservation. This recommendation, like the first one, helps the EPA to achieve its goal while staying within the limits of its institutional capacity. First, it does this by further disseminating the message that energy conservation is a means of protecting the environment, focusing on the message that the inefficient use of electricity harms the environment. Second, by providing grants to existing organizations rather than building a program from the ground up, the EPA puts

the responsibility of educating students in the hands of those who have experience and expertise in the field. The Agency can thus use its environmental expertise to provide these organizations with the information necessary to prepare a curriculum to teach students about the environmental impact of energy consumption and conservation.

Recommendation #3

The EPA should support legislative attempts to amend the Clean Air Act to require or suggest that least-cost emissions strategy be included in state implementation plans (SIPs). The Clean Air Act is not often amended. The fact that it is currently under review provides the EPA with a unique opportunity to voice its support for encouraging the use of least-cost emissions strategy as a means of reducing air pollution.

This recommendation also capitalizes on the fact that the EPA already has some measure of input into the process of evaluating proposed legislation. It suggests that the Agency use its institutional capacity to influence the development of legislation which will have a long-term impact on emissions.

FINAL REMARKS

The fact that this analysis offers only three recommendations should by no means imply that other future actions be ruled out. These recommendations are just the first step towards reducing emissions. It will be a long process -- energy consumption is not going to become efficient overnight nor is the greenhouse problem going to be reversed -- and this process will entail more than just energy efficiency. However, the EPA charged with abating pollution to the environment, and electricity conservation is an important means to that end.

ENDNOTES

1. Stephen Brick, David Schoengold and Jerry Mendl, STAR Report for the U.S. Environmental Protection Agency, Wisconsin Public Service Commission, Systems Planning, Environmental Review, and Consumer Analysis Division, Madison, Wisconsin, October 1987.

2. H.S. Geller, M.R. Ledbetter, E.L. Miller, and P.M. Miller, Acid Rain and Electricity Conservation, American Council for an Energy-Efficient Economy and the Energy Conservation Coalition, Washington, D.C., June 1987.

3. These figures were derived from the ACEEE study by Carol Etter and Chris Neil of RCG/Hagler, Bailly, Inc., and reported to the EPA in a memorandum to Robin Miles-McLean and Paul Schwengles assessing conservation as an emissions reduction tool, dated May 13, 1988.

4. The data in this paragraph is drawn from Reducing the Rate of Global Warming, the States' Role, by Sheila Machado and Rick Piltz, Renew America, Washington, D.C., November 1988.

5. Statement by William K. Reilly, EPA Administrator-Designate, before the Committee on Environment and Public Works, The United States Senate, January 31, 1989.

6. H.S. Geller, M.R. Ledbetter, E.L. Miller, and P.M. Miller, Acid Rain and Electricity Conservation, American Council for an Energy-Efficient Economy and the Energy Conservation Coalition, Washington, D.C., June 1987.

7. Paul Markowitz and Joseph Kriesberg, Least-Cost Electrical Planning: Is There Really a State Movement?, Public Citizen, December 1985.

8. These two examples come from: H.S. Geller, M.R. Ledbetter, E.L. Miller, and P.M. Miller, Acid Rain and Electricity Conservation, American Council for an Energy-Efficient Economy and the Energy Conservation Coalition, Washington, D.C., June 1987.

9. Least-Cost Utility Planning Handbook for Public Utility Commissioners, National Association of Regulatory Utility Commissioners, Washington, D.C., October 1988.

10. H.S. Geller, Energy and Economic Savings from the National Appliance Efficiency Standards, American Council for an Energy-Efficient Economy, Washington, D.C., March 1987.

11. See Profiles of Energy Efficiency Projects Jointly Operated by States and Utilities, Alliance to Save Energy, Washington, D.C., November 1988.

12. Telephone conversation on April 7, 1989, with Grant Vincent, ex-Blue Clue program manager, Bonneville Power Administration, Portland, Oregon.

13. Kennedy P. Maize, ed., Blueprint for the Environment, Advice to the President-Elect from America's Environmental Community, Blueprint for the Environment, Washington, D.C., November 1988.